PATENT ABSTRACTS OF JAPAN

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(54) HOLLOW FLOOR SLAB BRIDGE AND CONSTRUCTION THEREOF

(57)Abstract:
PROBLEM TO BE SOLVED: To prolong a span, and to simplify the temporary construction by dividing one span into three blocks, and forming an intermediate block with the composite structure of the cast-in-place concrete for connecting beam members to each other, forming blocks in both sides of the intermediate block of the cast-in-place concrete, and integrating the whole blocks by a PC cable.
SOLUTION: Among bridge beam in one span divided into three blocks, an intermediate block is formed of plural precast concrete beam members 1 prestressed and the cast-in place concrete, and both side blocks are formed of the cast-in place concrete 6. Plural beam members 1 are stretched in the intermediate blocks of the one span with a space in the cross direction, and the beam members 1 adjacent to each other in the cross direction are bonded by the cast-in-place concrete. The adjacent beam members 1 are bonded to each other at upper ends and lower ends thereof, and the intermediate block of the bridge beam is formed so as to have a chained cross section over the whole area. A PC cable 7 is arranged along he tensile side of the bridge beam, and stretched over the full length of the bridge beams.

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[Date of extinction of right]
* NOTICES *

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CLAIMS

[Claim(s)]
[Claim 1] Two or more digit members made from precast concrete which prestress is introduced beforehand, and the medium section sets spacing crosswise among the bridge girders of one effective span classified into the three sections, and are constructed, It is built in a hollow cross section from the in-situ concrete which joins the digit member of each other which adjoins crosswise. The hollow slab by which the section of the both sides of the medium section is built from an in-situ concrete in a hollow cross section, continues at the section and the medium section of both sides, a PC cable is constructed, and prestress is introduced into the overall length of a bridge girder.
[Claim 2] A bridge girder is a hollow slab according to claim 1 which is a continuous girder over at least 2 spans.
[Claim 3] Two or more digit members made from precast concrete by which prestress was beforehand introduced into the medium section among the bridge girders of one effective span classified into the three sections While joining the digit member of each other which sets and constructs spacing crosswise [the], places an in-situ concrete on the crosswise both sides, and adjoins crosswise and placing an in-situ concrete at the section of the both sides of the medium section The construction approach of the hollow slab which becomes it tense about a PC cable, introduces prestress into the overall length of a bridge girder, and builds claim 1 or a hollow slab according to claim 2 after continuing at the section and the medium section of both sides and constructing a PC cable.

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DETAILED DESCRIPTION

[Detailed Description of the Invention]
[0001]
[Field of the Invention] This invention relates to the hollow slab and its construction approach of reinforced concrete construction.
[0002]
[Description of the Prior Art] Although bridge girder weight of a hollow slab is lightweight by being a

hollow cross section, main part cost is held down and also there is an advantage which can take a large effective span by introducing prestress, it is the composite construction of the in-situ concrete which joins the digit member and its digit member of each other made from precast concrete conventionally, or since an overall length is covered and it is built by **********, a limitation is in huge-ization of an effective span.

[0003] Since an in-situ concrete joins a digit member crosswise [the] in the case of composite construction, an effective span is decided by the die length of a digit member, but since the limitation of the die length of a digit member is made into 20-25m order from the convenience of haulage, an effective span is restricted to less than [it].

[0004] When an overall length is **********, there is no constraint when expanding an effective span, but since it is necessary to cover the overall length of an effective span and to install timbering, temporary works large-scale-ize and there is disadvantage which a construction period protracts.

[0005] This invention proposes the hollow slab which attains huge-izing of an effective span, and simplification of temporary works, and its construction approach from the above-mentioned background.

[0006]

[Means for Solving the Problem] In this invention, one effective span is classified into the three sections, the medium section of them is built by the composite construction of the in-situ concrete which joins mutually the digit member and digit member made from precast concrete, the section of the both sides of the medium section is built by the in-situ concrete, and while enabling huge-ization of an effective span by unifying an entire interval by the PC cable, temporary works are simplified.

[0007] Prestress is introduced beforehand, the medium section is built in a hollow cross section from the in-situ concrete which joins two or more digit members made from precast concrete which set spacing crosswise and are constructed, and the digit member of each other which adjoins crosswise, and the section of the both sides of the medium section is built from an in-situ concrete in a hollow cross section.

[0008] A PC cable continues, and is constructed over the section and the medium section of both sides, and prestress is introduced into the overall length of a bridge girder. A PC cable is constructed over the overall length of a bridge girder also when a bridge girder is a continuous girder over at least 2 spans according to claim 2.

[0009] In the case of the conventional composite construction which a bridge girder becomes from a digit member and an in-situ concrete, an effective span stops at die-length extent of the limitation on the fabrication of a digit member at the maximum as aforementioned, but in this invention, since the medium section of composite construction is unified in the direction of an effective span by the in-situ concrete and PC cable of the section of the both sides, it becomes possible to realize the effective span of two-times extent of the die length of a digit member.

[0010] The depth of beam of the medium section is stopped from the case where a digit member without installation of prestress is used by using the digit member by which prestress was beforehand introduced into the medium section of the one effective spans. Consequently, when AUW of a bridge girder is lightweight-ized, huge-ization of an effective span is attained also from the field and it is conventionally made the same effective span as structure from the case where an overall length is composite construction, or the case of an in-situ concrete, reduction of main part cost is achieved by lightweight-ization. The depth of beam of a digit member can be further reduced by using a high strength concrete for the concrete of a digit member.

[0011] Moreover, in the medium section, since construction is performed only by placing the in-situ concrete which joins the adjoining digit member, it becomes unnecessary to install large-scale timbering in the lower part of the medium section, temporary works are simplified substantially, and compaction of a construction period is achieved.

[0012] From it not being necessary to install the large-scale timbering of the medium section caudad Although a limitation is in reduction of the depth of beam of the medium section from the relation to which the bending moment in the pars intermedia of an effective span becomes large when the bridge girder to which it becomes possible to construct a bridge girder also in the location which cannot install timbering in the space under a digit is a simple girder Since the bending moment in the pars intermedia

of an effective span becomes small when a bridge girder is a continuous girder according to claim 2 over at least 2 spans like, reduction of the depth of beam of the medium section is attained especially.
[0013] In the case of a continuous girder, also in a location with the constraint which bars erection, erection becomes possible according to the reduction effectiveness of the depth of beam of the medium section, and also design-effectiveness with the appearance which gives a light impression is born on an elevation surface.
[0014] Moreover, since a cross section can be changed in the direction of an effective span according to the bending moment in the section containing this medium supporting point because the section which contains the medium supporting point which a bridge girder follows in the case of claim 2 is an in-situ concrete, it can consider as structure more rational than the case where an overall length is composite construction.
[0015] Construction of a bridge girder two or more digit members made from precast concrete by which prestress was beforehand introduced into the medium section a passage according to claim 3 While joining the digit member of each other which sets and constructs spacing crosswise [the], places an in-situ concrete on the crosswise both sides, and adjoins crosswise and placing an in-situ concrete at the section of the both sides of the medium section After continuing at the section and the medium section of both sides and constructing a PC cable, it is carried out by becoming it tense about a PC cable and introducing prestress into the overall length of a bridge girder.
[0016]
[Embodiment of the Invention] As the hollow slab of claim 1 and claim 2 is shown in drawing 1 and drawing 2 , the medium section is built among the bridge girders of one effective span classified into the three sections from two or more digit members 1 and in-situ concretes 5 made from precast concrete into which prestress was introduced, and the section of both sides is built by the in-situ concrete 6. As for drawing 2 , in the case of a simple girder, drawing 1 shows the case of the continuous girder of two spans.
[0017] The sheath 3 for the digit member 1 being manufactured in I form, T form, or H form cross section, as shown in drawing 3 , and PC steel 2 for introducing prestress into the tension side beforehand inserting it in, and inserting in the location of the tension side except the location PC cable 7 which introduces prestress into a bridge girder overall length afterwards is arranged. From the upper bed and soffit of the digit member 1, the reinforcement 4 for unification with an in-situ concrete 5 projects on crosswise both sides. Any of pretension and a post tension are sufficient as the approach of introducing prestress at the time of the fabrication of the digit member 1.
[0018] As shown in drawing 4 which is the x-x line sectional view of drawing 2 , two or more digit members 1 set spacing crosswise, and are constructed over the medium section of one effective span, the digit members 1 and 1 of each other which adjoin crosswise are joined by the in-situ concrete 5, and the medium section of a bridge girder is built as the adjoining digit member 1 and a hollow cross section where a centrum is formed between one.
[0019] In an upper bed and a soffit, it is joined mutually, and since the medium section of a bridge girder is covering all ** and carrying out a closeout cross section, the restricted effectiveness of the digit member 1 and one comrades goes up it and the adjoining digit members 1 and 1 hold the shear rigidity of the cross direction of the digit member 1, and flexural rigidity, crosswise [of the digit member 1], they do not need exceptional binding.
[0020] As shown in drawing 6 which is drawing 5 and the z-z line sectional view which are a y-y line sectional view of drawing 2 , the section of the both sides of the medium section is built by the in-situ concrete 6 as a hollow cross section where a centrum follows the centrum of the medium section. In the case of a continuous girder, as shown in drawing 2 , the cross section of the section by the side of the edge supporting point continues in the direction of an effective span, while it has been the same, but the cross section of the section containing the medium supporting point which a bridge girder follows changes in the direction of an effective span according to the bending moment, and depth of beam becomes max on the medium supporting point.
[0021] PC cable 7 is arranged in accordance with the tension side of a bridge girder, as shown in drawing 1 and drawing 2 , and it is constructed over the overall length of a bridge girder. In the case of a continuous girder, it is continuously continued and constructed over all spans.
[0022] The construction procedure of building the bridge girder of the 2 span continuous girder shown

in drawing 2 is shown in drawing 7 - drawing 11.
[0023] Construction of a bridge girder assembles timbering 8 under the placing section of an in-situ concrete 6 (drawing 7). The digit member 1 is constructed between the edges of the timbering 8 and 8 which is the medium section of one effective span (drawing 8). While placing iron rods on each timbering 8 which is the section of the both sides of the medium section and placing an in-situ concrete 6 (drawing 9) While joining the digit members 1 and 1 of each other which adjoin crosswise by the in-situ concrete 5 (drawing 10), it continues at an entire interval, PC cable 7 is inserted in, and it is become tense about this (drawing 11), and is carried out by introducing prestress into the digit member 1 and an in-situ concrete 6.
[0024] At the time of use of iron rods of a up to [timbering 8], the sheath which PC cable 7 inserts in is arranged succeeding the sheath 3 arranged at the digit member 1. Although the stage of insertion of PC cable 7 does not ask the placing order of the in-situ concrete 6 to a timbering 8 top, stress of PC cable 7 is performed by waiting for hardening of in-situ concretes 6 and 5.
[0025] The digit member 1 and the point of junction of one are shown in drawing 12 - drawing 15.
[0026] After junction of the digit members 1 and 1 mounts the bottom slab form 9 between the soffits of the adjoining digit members 1 and 1 (drawing 12) and places an in-situ concrete 5 on it (drawing 13), while it mounts the elevated flooring version shuttering 10 between the upper beds of the adjoining digit members 1 and 1 The overhang shuttering 11 is installed in the outside of the digit member 1 located in the crosswise edge of a bridge girder (drawing 14), and it is carried out by placing an in-situ concrete 5 on both the shuttering 10 and 11.
[0027] The activity to placing of the in-situ concrete 5 from the installation of the bottom slab form 9 to the bottom slab form 9 top is done using the footing 12 which hangs from the digit member 1.
[0028]
[Effect of the Invention] Since it is the structure which classified one effective span into the three sections, built the medium section of them by the composite construction of the in-situ concrete which joins mutually the digit member and the digit member made from precast concrete, built the section of the both sides of the medium section by the in-situ concrete, and unified the entire interval by the PC cable, the limit on the effective-span amplification in the case of the composite construction which consists of a conventional digit member and a conventional in-situ concrete is lost, and it becomes possible to realize the effective span of two-times extent from structure conventionally.
[0029] When AUW of a bridge girder is lightweight-ized, huge-ization of an effective span is attained also from the field and it is conventionally made the same effective span as structure from the case where an overall length is composite construction since the depth of beam of the medium section is stopped from the case where a digit member without installation of prestress is used, or the case of an in-situ concrete, by using the digit member by which prestress was especially introduced into the medium section of the one effective spans beforehand, reduction of main part cost is achieved by lightweight-ization.
[0030] Moreover, in the medium section, since construction is performed only by placing the in-situ concrete which joins the adjoining digit member, it becomes unnecessary to install large-scale timbering in the lower part of the medium section, temporary works are simplified substantially, and compaction of a construction period is achieved.
[0031] It becomes possible to construct a bridge girder by it not being necessary to install the large-scale timbering of the medium section caudad also in the location which cannot install timbering in a clear headway under girder.
[0032] Since the bending moment in the pars intermedia of an effective span becomes small in claim 2 whose bridge girder is a continuous girder over at least 2 spans, the effectiveness of reducing especially the depth of beam of the medium section is high, also in a location with the constraint which bars erection according to the effectiveness, erection becomes possible, and also design-effectiveness with a light appearance is acquired on an elevation surface.
[0033] Moreover, since a cross section can be changed according to the bending moment because the section which contains the medium supporting point which a bridge girder follows in the case of claim 2 is an in-situ concrete, it can consider as structure more rational than the case where an overall length is composite construction.

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DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]
[Drawing 1] It is the elevation having shown the bridge girder of a simple girder.
[Drawing 2] It is the elevation having shown the bridge girder of a continuous girder.
[Drawing 3] It is the sectional view having shown the example of a fabrication of a digit member.
[Drawing 4] It is the x-x line sectional view of drawing 2 .
[Drawing 5] It is the y-y line sectional view of drawing 2 .
[Drawing 6] It is the z-z line sectional view of drawing 2 .
[Drawing 7] It is the elevation having shown signs that timbering was assembled.
[Drawing 8] It is the elevation having shown signs that the digit member was constructed.
[Drawing 9] It is the elevation having shown signs that the in-situ concrete was placed on timbering.
[Drawing 10] It is the elevation having shown signs that the digit member was joined.
[Drawing 11] It is the elevation in which having inserted the PC cable in and having shown signs that it was become tense.
[Drawing 12] It is the sectional view having shown signs that the bottom slab form was mounted between the soffits of a digit member.
[Drawing 13] It is the sectional view having shown signs that the in-situ concrete was placed on the bottom slab form.
[Drawing 14] It is the sectional view having shown signs that the elevated flooring version shuttering was mounted between the upper beds of a digit member.
[Drawing 15] It is the sectional view having shown signs that the in-situ concrete was placed on the elevated flooring version shuttering.
[Description of Notations]
1 [.. Reinforcement, 5 / .. An in-situ concrete, 6 / .. An in-situ concrete, 7 / .. A PC cable, 8 / .. Timbering, 9 / .. A lower slab form, 10 / .. A up slab form, 11 / .. Overhang shuttering, 12 / .. Footing.] .... A digit member, 2 .. PC steel, 3 .. A sheath, 4

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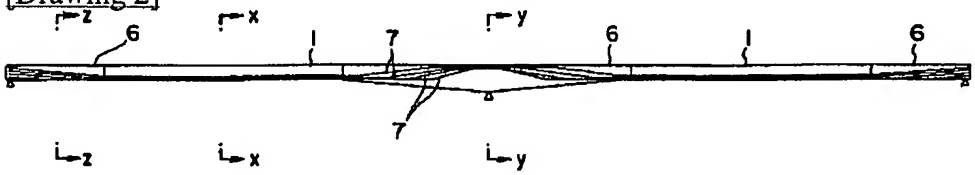
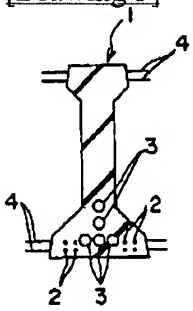
DRAWINGS

[Drawing 1]

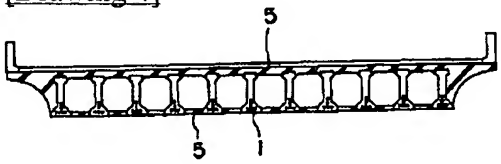
[Drawing 2]



[Drawing 3]



[Drawing 4]



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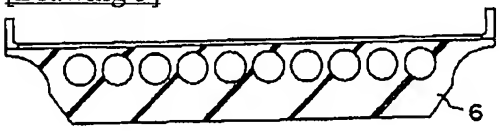
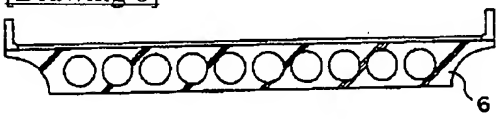
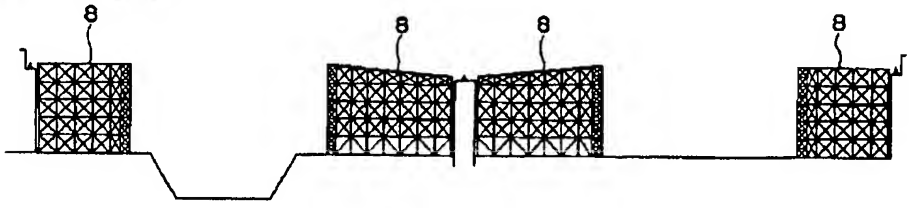


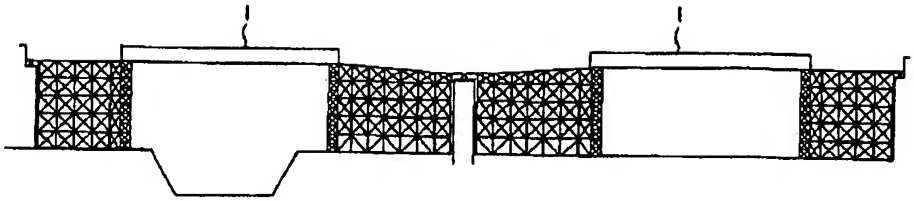
[Drawing 6]



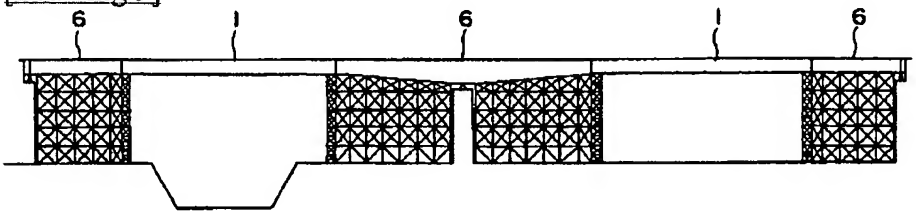
[Drawing 7]



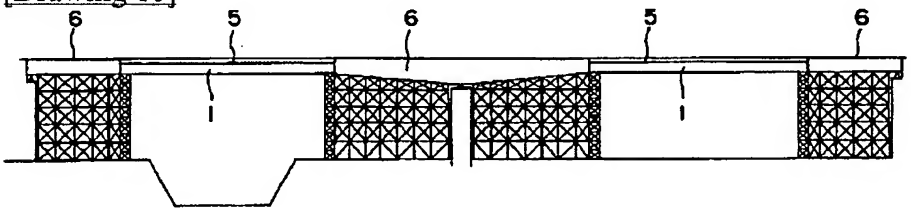
[Drawing 8]



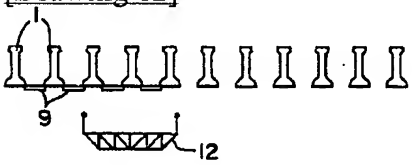
[Drawing 9]



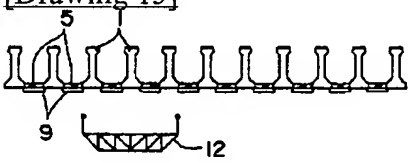
[Drawing 10]



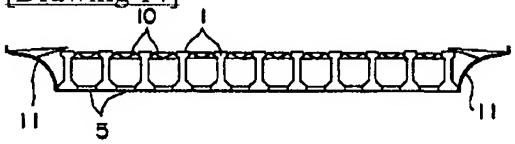
[Drawing 12]



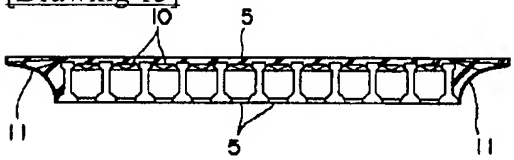
[Drawing 13]



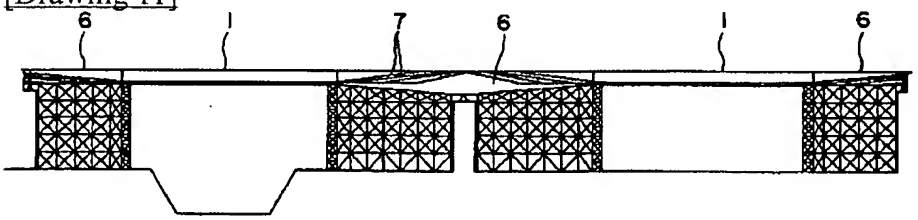
[Drawing 14]



[Drawing 15]



[Drawing 11]



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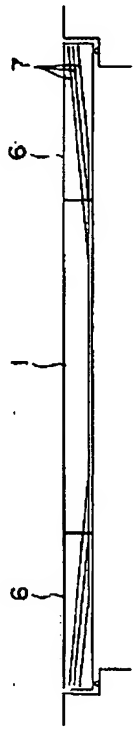
(54)【発明の名称】　中空床版橋及びその構築方法

(57)【要約】
【課題】　中空床版橋の支間の長大化を可能にする。
【解決手段】　一支間を三区間に区分し、その内の中間区間を、プレキャストコンクリート製の桁部材１と桁部材１，１を互いに接合する場所打ちコンクリート５の合成構造で構築し、中間区間の両側の区間を場所打ちコンクリート６で構築し、全区間をＰＣケーブル７で一体化する。



【特許請求の範囲】

【請求項１】　三区間に区分された一支間の橋桁の内、中間区間が、予めプレストレスが導入され、幅方向に間隔をおいて架設される複数本のプレキャストコンクリート製の桁部材と、幅方向に隣接する桁部材を互いに接合する場所打ちコンクリートから中空断面で構築され、中間区間の両側の区間が場所打ちコンクリートから中空断面で構築され、両側の区間と中間区間に亘ってＰＣケーブルが架設され、橋桁の全長にプレストレスが導入されている中空床版橋。

【請求項２】　橋桁は少なくとも二径間に跨る連続桁である請求項１記載の中空床版橋。

【請求項３】　三区間に区分された一支間の橋桁の内、中間区間に、予めプレストレスが導入された複数本のプレキャストコンクリート製の桁部材を、その幅方向に間隔をおいて架設し、その幅方向両側に場所打ちコンクリートを打設して幅方向に隣接する桁部材を互いに接合する一方、中間区間の両側の区間に場所打ちコンクリートを打設すると共に、両側の区間と中間区間に亘ってＰＣケーブルを架設した後、ＰＣケーブルを緊張し、橋桁の全長にプレストレスを導入して請求項１，もしくは請求項２記載の中空床版橋を構築する中空床版橋の構築方法。

【発明の詳細な説明】

【０００１】

【発明の属する技術分野】この発明は鉄筋コンクリート造の中空床版橋及びその構築方法に関するものである。

【０００２】

【従来の技術及び発明が解決しようとする課題】中空床版橋は中空断面であることにより橋桁重量が軽量で、躯体コストが抑えられる他、プレストレスを導入することで支間を大きく取れる利点があるが、従来はプレキャストコンクリート製の桁部材とその桁部材を互いに接合する場所打ちコンクリートの合成構造で、もしくは全長に亘って場所打ちコンクリート造で構築されるため、支間の長大化に限界がある。

【０００３】合成構造の場合、場所打ちコンクリートは桁部材をその幅方向に接合することから、支間は桁部材の長さで決まるが、桁部材の長さの限界は運搬の都合から20～25m前後とされるため、支間はそれ以下に制限される。

【０００４】全長が場所打ちコンクリート造の場合には、支間を拡大する上での制約はないが、支間の全長に亘って支保工を設置する必要があるため、仮設工事が大規模化し、工期が長期化する不利がある。

【０００５】この発明は上記背景より、支間の長大化と仮設工事の簡素化を図る中空床版橋とその構築方法を提案するものである。

【０００６】

【課題を解決するための手段】本発明では一支間を三区間に区分し、その内の中間区間を、プレキャストコンクリート製の桁部材と桁部材を互いに接合する場所打ちコンクリートの合成構造で構築し、中間区間の両側の区間を場所打ちコンクリートで構築し、全区間をＰＣケーブルで一体化することにより支間の長大化を可能にすると共に、仮設工事を簡素化する。

【０００７】中間区間は、予めプレストレスが導入され、幅方向に間隔をおいて架設される複数本のプレキャストコンクリート製の桁部材と、幅方向に隣接する桁部材を互いに接合する場所打ちコンクリートから中空断面で構築され、中間区間の両側の区間は場所打ちコンクリートから中空断面で構築される。

【０００８】ＰＣケーブルは両側の区間と中間区間に亘って架設され、橋桁の全長にプレストレスが導入される。橋桁が請求項２に記載の、少なくとも二径間に跨る連続桁である場合もＰＣケーブルは橋桁の全長に架設される。

【０００９】橋桁が桁部材と場所打ちコンクリートからなる従来の合成構造の場合、前記の通り、支間は最大で桁部材の製作上の限界の長さ程度に留まるが、本発明では合成構造の中間区間が、その両側の区間の場所打ちコンクリートとＰＣケーブルによって支間方向に一体化されるため、桁部材の長さの二倍程度の支間を実現することが可能になる。

【００１０】一支間の内の中間区間に、予めプレストレスが導入された桁部材を用いることで、プレストレスの導入がない桁部材を用いる場合より中間区間の桁高が抑えられる。その結果、全長が合成構造の場合や場所打ちコンクリートの場合より橋桁の総重量が軽量化され、その面からも支間の長大化が可能になり、従来構造と同一の支間にした場合には軽量化により躯体コストの低減が図られる。桁部材の桁高は桁部材のコンクリートに高強度コンクリートを使用することで一層低減できる。

【００１１】また中間区間では隣接する桁部材を接合する場所打ちコンクリートを打設するのみで構築が行われるため、中間区間の下方には大規模な支保工を設置する必要がなくなり、仮設工事が大幅に簡素化され、工期の短縮が図られる。

【００１２】中間区間の下方に大規模な支保工を設置する必要がないことから、桁下の空間に支保工を設置できない場所においても橋桁を架設することが可能になる橋桁が単純桁の場合は支間の中間部における曲げモーメントが大きくなる関係から中間区間の桁高の低減に限界があるが、請求項２に記載のように橋桁が少なくとも二径間に跨る連続桁である場合には支間の中間部における曲げモーメントが小さくなるため、特に中間区間の桁高の低減が可能になる。

【００１３】連続桁の場合、中間区間の桁高の低減効果により、架設を妨げる制約のある場所においても架設が可能になる他、立面上、軽快な印象を与える外観を持つ

意匠的効果も生まれる。

【００１４】また請求項２の場合、橋桁が連続する中間支点を含む区間が場所打ちコンクリートであることで、この中間支点を含む区間においては曲げモーメントに応じて支間方向に断面を変化させることができるため、全長が合成構造の場合より合理的な構造とすることができる。

【００１５】橋桁の構築は請求項３に記載の通り、中間区間に、予めプレストレスが導入された複数本のプレキャストコンクリート製の桁部材を、その幅方向に間隔をおいて架設し、その幅方向両側に場所打ちコンクリートを打設して幅方向に隣接する桁部材を互いに接合する一方、中間区間の両側の区間に場所打ちコンクリートを打設すると共に、両側の区間と中間区間に亘ってＰＣケーブルを架設した後、ＰＣケーブルを緊張して橋桁の全長にプレストレスを導入することにより行われる。

【００１６】

【発明の実施の形態】請求項１及び請求項２の中空床版橋は図１，図２に示すように三区間に区分された一支間の橋桁の内、中間区間が、プレストレスが導入された複数本のプレキャストコンクリート製の桁部材１と場所打ちコンクリート５から構築され、両側の区間が場所打ちコンクリート６で構築されるものである。図１は単純桁の場合、図２は二径間の連続桁の場合を示す。

【００１７】桁部材１は図３に示すようにＩ形やＴ形，あるいはＨ形断面で製作され、引張側に予めプレストレスを導入するためのＰＣ鋼材２が挿通し、その位置を除く引張側の位置に、後から橋桁全長にプレストレスを導入するＰＣケーブル７を挿通するためのシース３が配置される。桁部材１の上端と下端からは場所打ちコンクリート５との一体化のための鉄筋４が幅方向両側に突出する。桁部材１の製作時にプレストレスを導入する方法はプレテンションとポストテンションのいずれでもよい。

【００１８】図２のｘ－ｘ線断面図である図４に示すように複数本の桁部材１は幅方向に間隔をおいて一支間の中間区間に架設され、幅方向に隣接する桁部材１，１は場所打ちコンクリート５によって互いに接合され、橋桁の中間区間は隣接する桁部材１，１間に中空部が形成される中空断面として構築される。

【００１９】隣接する桁部材１，１は上端と下端において互いに接合され、橋桁の中間区間は全成に亘って閉鎖断面をすることで、桁部材１，１同士の拘束効果が上がり、桁部材１の幅方向のせん断剛性と曲げ剛性を保有するため、桁部材１の幅方向には格別な緊結を必要としない。

【００２０】図２のｙ－ｙ線断面図である図５，ｚ－ｚ線断面図である図６に示すように中間区間の両側の区間は中間区間の中空部に、中空部が連続する中空断面として場所打ちコンクリート６によって構築される。連続桁の場合、図２に示すように端部支点側の区間の断面は同一のまま支間方向に連続するが、橋桁が連続する中間支点を含む区間の断面は曲げモーメントに応じて支間方向に変化し、中間支点上で桁高が最大になる。

【００２１】ＰＣケーブル７は図１，図２に示すように橋桁の引張側に沿って配置され、橋桁の全長に架設される。連続桁の場合は全径間に亘って連続して架設される。

【００２２】図２に示す二径間連続桁の橋桁を構築する施工手順を図７～図11に示す。

【００２３】橋桁の構築は、場所打ちコンクリート６の打設区間の下に支保工８を組み立て（図７）、一支間の中間区間である支保工８，８の端部間に桁部材１を架設し（図８）、中間区間の両側の区間である各支保工８上に配筋し、場所打ちコンクリート６を打設する一方（図９）、幅方向に隣接する桁部材１，１を場所打ちコンクリート５によって互いに接合すると共に（図10）、全区間に亘ってＰＣケーブル７を挿通してこれを緊張し（図11）、桁部材１と場所打ちコンクリート６にプレストレスを導入することにより行われる。

【００２４】支保工８上への配筋時には桁部材１に配置されているシース３に連続し、ＰＣケーブル７が挿通するシースが配置される。ＰＣケーブル７の挿通の時期は支保工８上への場所打ちコンクリート６の打設の前後を問わないが、ＰＣケーブル７の緊張は場所打ちコンクリート６，５の硬化を待って行われる。

【００２５】図12～図15に桁部材１，１の接合の要領を示す。

【００２６】桁部材１，１の接合は、隣接する桁部材１，１の下端間に下床版型枠９を跨設し（図12）、その上に場所打ちコンクリート５を打設した後（図13）、隣接する桁部材１，１の上端間に上床版型枠10を跨設すると共に、橋桁の幅方向端部に位置する桁部材１の外側に張出型枠11を設置し（図14）、両型枠10，11上に場所打ちコンクリート５を打設することにより行われる。

【００２７】下床版型枠９の設置から下床版型枠９上への場所打ちコンクリート５の打設までの作業は桁部材１から懸垂する足場12を利用して行われる。

【００２８】

【発明の効果】一支間を三区間に区分し、その内の中間区間を、プレキャストコンクリート製の桁部材と桁部材を互いに接合する場所打ちコンクリートの合成構造で構築し、中間区間の両側の区間を場所打ちコンクリートで構築し、全区間をＰＣケーブルで一体化した構造であるため、従来の桁部材と場所打ちコンクリートからなる合成構造の場合の支間拡大上の制限がなくなり、従来構造より二倍程度の支間を実現することが可能になる。

【００２９】特に一支間の内の中間区間に、予めプレストレスが導入された桁部材を用いることで、プレストレスの導入がない桁部材を用いる場合より中間区間の桁高が抑えられるため、全長が合成構造の場合や場所打ちコ

ンクリートの場合より橋桁の総重量が軽量化され、その面からも支間の長大化が可能になり、従来構造と同一の支間にした場合には軽量化により躯体コストの低減が図られる。

【００３０】また中間区間では隣接する桁部材を接合する場所打ちコンクリートを打設するのみで構築が行われるため、中間区間の下方には大規模な支保工を設置する必要がなくなり、仮設工事が大幅に簡素化され、工期の短縮が図られる。

【００３１】中間区間の下方に大規模な支保工を設置する必要がないことで、桁下空間に支保工を設置できない場所においても橋桁を架設することが可能になる。

【００３２】橋桁が少なくとも二径間に跨る連続桁である請求項２では支間の中間部における曲げモーメントが小さくなるため、特に中間区間の桁高を低減する効果が高く、その効果によって架設を妨げる制約のある場所においても架設が可能になる他、立面上、軽快な外観を持つ意匠的効果も得られる。

【００３３】また請求項２の場合、橋桁が連続する中間支点を含む区間が場所打ちコンクリートであることで、曲げモーメントに応じて断面を変化させることができるため、全長が合成構造の場合より合理的な構造とすることができる。

【図面の簡単な説明】

【図１】単純桁の橋桁を示した立面図である。

【図２】連続桁の橋桁を示した立面図である。

【図３】桁部材の製作例を示した断面図である。

【図４】図２のｘ－ｘ線断面図である。

【図５】図２のｙ－ｙ線断面図である。

【図６】図２のｚ－ｚ線断面図である。

【図７】支保工を組み立てた様子を示した立面図である。

【図８】桁部材を架設した様子を示した立面図である。

【図９】支保工上に場所打ちコンクリートを打設した様子を示した立面図である。

【図１０】桁部材を接合した様子を示した立面図である。

【図１１】ＰＣケーブルを挿通し、緊張した様子を示した立面図である。

【図１２】桁部材の下端間に下床版型枠を跨設した様子を示した断面図である。

【図１３】下床版型枠上に場所打ちコンクリートを打設した様子を示した断面図である。

【図１４】桁部材の上端間に上床版型枠を跨設した様子を示した断面図である。

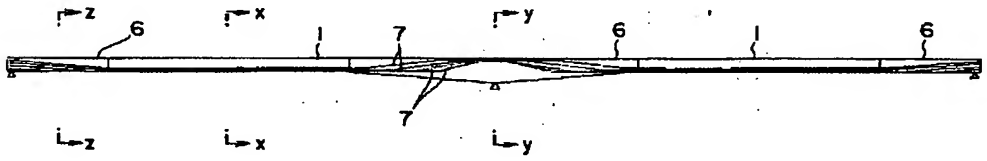
【図１５】上床版型枠上に場所打ちコンクリートを打設した様子を示した断面図である。

【符号の説明】

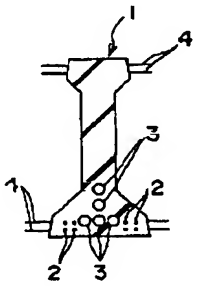
１……桁部材、２……ＰＣ鋼材、３……シース、４……鉄筋、５……場所打ちコンクリート、６……場所打ちコンクリート、７……ＰＣケーブル、８……支保工、９……下床版型枠、10……上床版型枠、11……張出型枠、12……足場。

【図１】

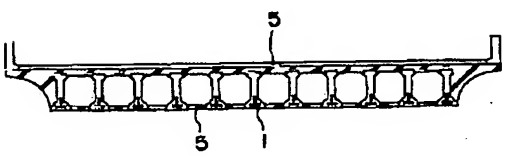
【図２】



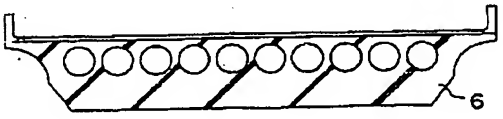
【図３】



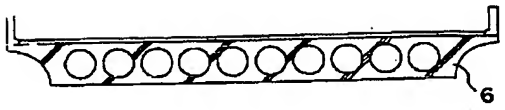
【図４】



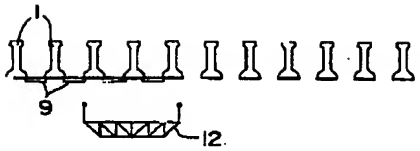
【図５】



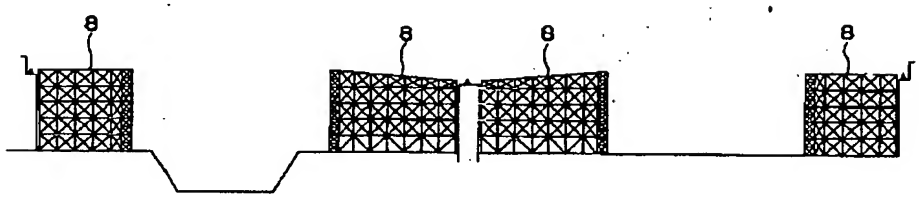
【図6】



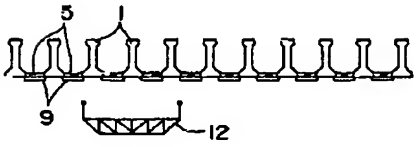
【図12】



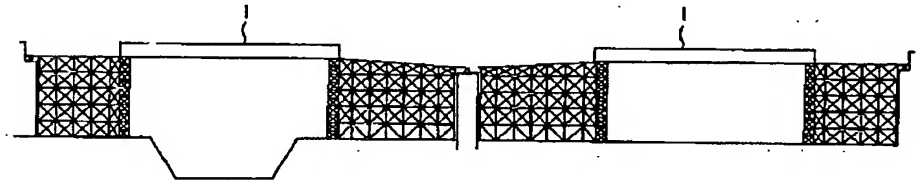
【図7】



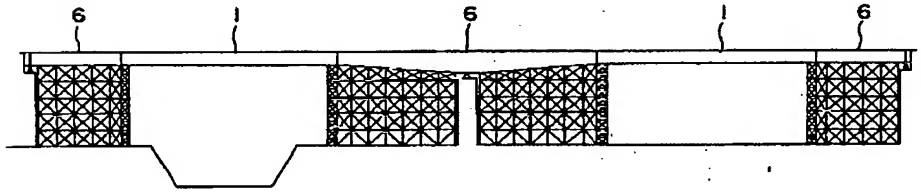
【図13】



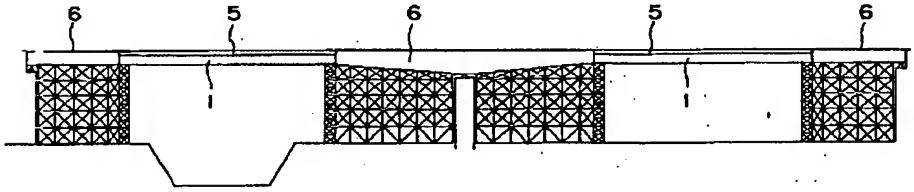
【図8】



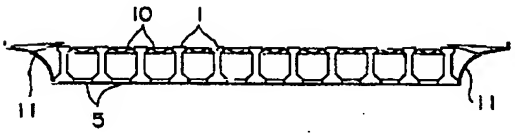
【図9】



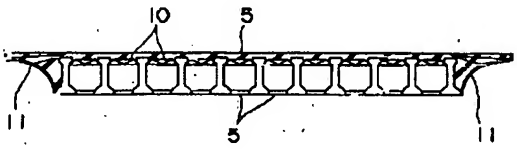
【図10】



【図14】



【図15】



【図１１】